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EXAMINER

KUBELIK, ANNE R

ART UNIT

PAPER NUMBER

1638

DATE MAILED: 01.13.2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-------------------------------|--|--|
| Office Action Summary | Application No. 09/553,431 | Applicant(s) OSTERYOUNG, KATHERINE P. | |
| | Examiner Anne R. Kubelik | Art Unit 1638 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 October 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10 and 14-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10 and 14-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on with the application is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 22 October 2002 has been entered.
2. The cancellation of claims 9 and 11-13, the amendment of claims 1, 3, 6, 14, 16, 19-20, 22, 24 and 26-28, and the addition of new claim 29 requested in Paper No. 13, filed 22 October 2002, have been entered. Claims 1-8, 10 and 14-29 are pending.
3. As Applicant elected Group I, drawn to the Arabidopsis MinD gene, SEQ ID NO:1 and methods of its use, Applicant is required to delete references to a nucleic acid encoding a Tagetes MinD protein, as these are nonelected sequences.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. The disclosure is objected to because it contains embedded hyperlinks and/or other forms of browser-executable code. See pg 12, line 27. Applicant is required to delete the embedded hyperlinks and/or other forms of browser-executable code. See MPEP § 608.01.
6. This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825.

Sequence identifiers are missing from pg 14, lines 7-8.

Full compliance with the sequence rules is required in response to this Office action. A complete response to this Office action must include both compliance with the sequence rules

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and a response to the issues set forth below. Failure to fully comply with both of these requirements in the time period set forth in this Office action will be held to be non-responsive.

Response to Amendment

7. The rejection of claims 24-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention is WITHDRAWN in light of amendment to claim 24.

Response to Arguments

8. The rejection of claims 1,4, 7, 10-12, 14, 17, 20, 23-24 and 27 under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention is WITHDRAWN in light of Applicant pointing to support for the phrase "the MinD gene encoding a protein having at least a 50% sequence identity with SEQ ID NO:2".

Claim Objections

9. Claims 6, 16, 19, 22, 26 and 28 are objected to because there is only one member of the group. It is suggested that "selected from the group consisting of" be deleted.

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Claim Rejections - 35 USC § 112

10. Claims 1-2, 4-5, 7, 10-12, 14-15, 17-18, 20-21, 23-24 and 27 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an *Arabidopsis* MinD gene encoding SEQ ID NO:2, plants transformed with that gene, and methods of using that gene to alter size, shape and/or number of plastids, does not reasonably provide enablement for any MinD coding sequence from any source, plants transformed with any MinD coding sequence, or methods of using any MinD coding sequence to alter size, shape and/or number of plastids. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The rejection is repeated for the reasons of record as set forth in the Office action mailed 16 September 2002, as applied to claims 1, 4, 7, 10-12, 14, 17, 20, 23-24 and 27. Applicant's arguments filed 22 October 2002 have been fully considered but they are not persuasive.

Applicant urges that the claims recite that the nucleic acid encodes a protein with 80% sequence identity to SEQ ID NO:2, not hybridization conditions. Applicant urges that plants transformed with proteins that do not alter plastid size or number would not fall within the scope of the claims. Applicant urges that it is possible to make conservative substitutions in any protein and preserve its function. Applicant urges that they have described a *Tagetes* gene and an *Arabidopsis* one, thus showing that similar genes can be found in other plants. Applicant urges that the two genes share 92% identity and believe that any gene encoding a protein with 80% identity would have the same effect. Applicant urges that the structural limitation is reasonable (response pg 5-6).

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This is not found persuasive because the instant specification fails to teach plant MinD sequences encoding MinD proteins with 80% identity to SEQ ID NO:2. The specification also fails to provide guidance for the construction or isolation of such sequences. The specification also fails to teach any *Arabidopsis* or *Tagetes* MinD genes other than SEQ ID NOs:1 and 3.

SEQ ID NO:1 encodes a 326 amino acid long protein. Making all possible **single** amino acid substitutions in an 326 amino acid long protein like that encoded by SEQ ID NO:1 would require making and analyzing 19^{325} nucleic acids. Because nucleic acids encoding proteins with 80% identity to SEQ ID NO:1 would encode proteins with 65 amino acid substitutions, many more than 19^{326} nucleic acids would need to be made and analyzed. Applicant has only described two sequences, and has not provided guidance for which amino acids of SEQ ID NO:2 can be altered to which other amino acids, and which amino acids must not be changed to maintain MinD activity of the encoded protein.

The specification does not teach the structural features that distinguish nucleic acids that encode MinD proteins with 80% identity to SEQ ID NO:2 from those that encode nonfunctional proteins with 80% identity to SEQ ID NO:2.

11. Claim 29 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for alteration of size, shape and/or number of plastids in *Arabidopsis* via antisense expression of SEQ ID NO:1, does not reasonably provide enablement for alteration of size, shape and/or number of plastids in any plant via antisense expression of SEQ ID NO:1. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The rejection is repeated for the reasons of record as set forth in the Office action mailed

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16 September 2002, as applied to claims 1-7 and 10-26. Applicant's arguments filed 22 October 2002 have been fully considered but they are not persuasive.

Applicant urges that claim 29 recites that the sequence of the MinD gene in the target plant is known. Applicant urges a that construction of an antisense construct of the plant used is a generalized method and generalizable to all plants containing a MinD gene (response pg 6-7).

This is not found persuasive. The instant specification fails to provide guidance for exact hybridization or amplification conditions and probes/primers to use in isolation of nucleic acids other than SEQ ID NO:1 or 3.

12. Claims 1-2, 4-5, 7, 10-12, 14-15, 17-18, 20-21, 23-24, 27 and 29 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The rejection is repeated for the reasons of record as set forth in the Office action mailed 16 September 2002, as applied to claims 1, 4, 7, 10-12, 14, 17, 20, 23-24 and 27.

The instant specification fails to describe the sequence of the multitude of MinD genes encoding a MinD protein with 80% sequence identity to SEQ ID NO:2. No description is provided as to the structural features that distinguish all such plant MinD genes from other plant genes, and no description is provided as to essential motifs that define MinD genes. The specification does not describe the structural features that distinguish nucleic acids that encode MinD proteins with 80% identity to SEQ ID NO:2 from those that encode nonfunctional proteins with 80% identity to SEQ ID NO:2.

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13. Claims 1-8, 10 and 14-29 are free of the prior art, given the failure of the prior art to teach or fairly suggest methods of altering the size, shape and/or number of plastids in plant cells by transformation with a sense or antisense MinD gene, the constructs used in that method, or the plants or seeds so obtained. The prior art also fails to teach or suggest a nucleic acid of SEQ ID NO:1.

Conclusion

14. No claim is allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne R. Kubelik, whose telephone number is (703) 308-5059. The examiner can normally be reached Monday through Friday, 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson, can be reached at (703) 306-3218. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9307 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Customer Service at (703) 308-0198.

Anne R. Kubelik, Ph.D.
January 3, 2003



AMY J. NELSON, PH.D.
SUPERVISORY PATENT EXAMINER
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